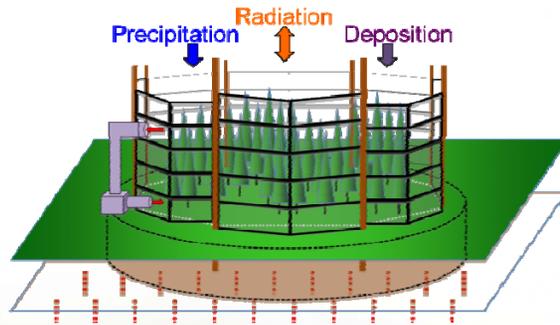


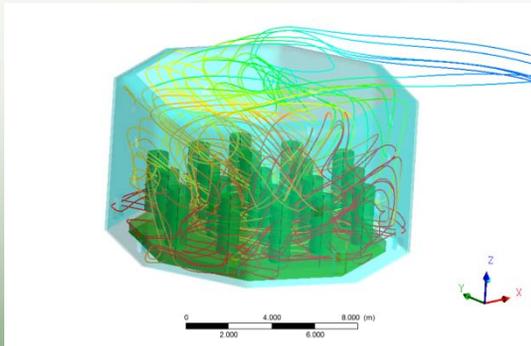
# Flow and Heat Transfer in an Open Top Chamber

Modeling and Simulation Group

Computational Sciences & Engineering Division



SPRUCE Open Top Chamber schematic



Flow and heat transfer calculations with CFX around and inside the chamber

## Problem Statement:

- Experimental platforms are being built to study the impact of global warming on important terrestrial ecological systems. A chamber with below and above ground systems was built at ORNL. The chamber has no roof in order to not interfere with precipitation, radiation, and deposition processes from the outside.

## Technical Approach:

- A 3-D model was developed in order to estimate the power needed for increasing the temperature inside the chamber by 3°C, 6°C, and 9°C. Additional calculations were performed to investigate the carbon dioxide distribution inside the chamber.

## Benefit:

- The modeling supported the research and engineering team to build a high quality experimental platform.

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